

Eelgrass Restoration at the Brightwater Marine Outfall

By Kimberle Stark, Marine Biologist

Why Care About Eelgrass?

Eelgrass (*Zostera marina*) is a native perennial plant that forms underwater meadows (beds) in marine nearshore environments. Eelgrass provides nursery habitat for many commercially important fish and invertebrates as well as providing food and spawning substrate.

Background

The King County Wastewater Treatment Division's new Brightwater Wastewater Treatment Plant will discharge highly treated effluent through a marine outfall to Puget Sound. After a comprehensive siting process to find a suitable location for the outfall pipe and to minimize effects on the nearshore marine environment, the Point Wells site near the King/Snohomish County line was selected. Construction of the outfall began in late May of 2008. Open-trench construction was used through onshore and nearshore areas to a depth of -80 feet (ft) Mean Lower Low Water (MLLW). Trench shoring (sheeting) was used to a depth of -30 ft MLLW to minimize impacts to eelgrass and other biological resources. Eelgrass is sparse at the outfall site, occurring from about -2 to -15 ft MLLW.

To mitigate for unavoidable construction impacts to eelgrass areas, an innovative eelgrass restoration plan was developed in collaboration with state agencies in 2004.

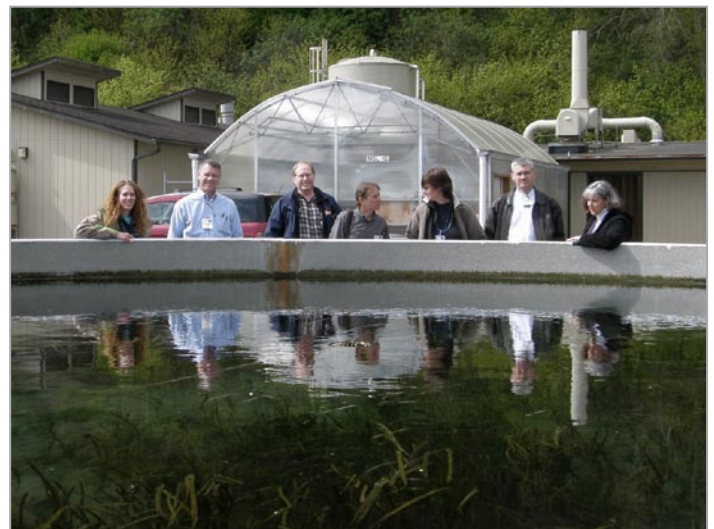
About the Project

The project objective is to restore intertidal and shallow subtidal eelgrass habitat to preconstruction conditions. This will be accomplished by several elements including: (1) pre-construction surveys; (2) eelgrass harvesting and propagation prior to construction; (3) establishing experimental harvest plots to assess eelgrass recovery; (4) transplanting; and (5) post-construction surveys. Each element is described below:

Pre-construction surveys: The purpose of preconstruction surveys was to document the extent and density of eelgrass at the project and reference sites and to assess inter-annual variation. Five survey transects at the project site were established and a combination of side-scan sonar, underwater video, and SCUBA diver methods were used in 2004, 2006 and 2008.

Experimental harvest plots: In an effort to assist state agencies on the effects of removing a portion of eelgrass from a donor bed, experimental harvest plots were established at the outfall site in 2004. Five 2.0 m² rectangular plots were established in the area where all eelgrass would be lost during construction. The plots were divided into eight subplots and each subplot had a specific amount of eelgrass harvested—0%, 5%, 10%, 25%, 50%, and 100%. The harvest plots were monitored by SCUBA divers in 2005, 2006 and 2007.

Transplanting: In early spring 2009, a side-scan sonar and underwater video survey will be conducted to determine if eelgrass was disturbed outside of the outfall construction zone, which would require replanting. Following this survey, eelgrass in the tanks at Battelle will be transplanted back to the project site in all areas where eelgrass was disturbed. SCUBA divers will bundle the plants together and place them into the substrate. Transplanting is expected to occur in May 2009 during the active growing season to allow the plants time to reestablish prior to winter storms.



Eelgrass Salvage Effort: In an effort to avoid harvesting eelgrass from a donor site for transplanting after construction, a portion of existing eelgrass was harvested from the project site in 2004, 2006, 2007 and propagated offsite at Battelle Marine Sciences Laboratory. Most of the eelgrass that would have been lost during construction was salvaged in 2008 and planted into the Battelle tanks along with the other Brightwater eelgrass.



Consultant in scuba gear salvaging eelgrass.

Post-construction surveys: Eelgrass surveys will be conducted following transplanting to document eelgrass recovery and assess recovery against both short-term and long-term project performance standards. The series of five survey transects will be reestablished and SCUBA divers will count the number of eelgrass plants in 2009, 2010, 2011 and 2014.

For a more detailed description of all the elements listed above, please read the *Eelgrass Restoration and Biological Resources Implementation Workplan* at <http://green.kingcounty.gov/marine/Reports.htm>. Project reports are also available on this Web site.

About King County's SciFYI

Published by:



King County

Department of Natural Resources and Parks
Water and Land Resources Division
Science and Technical Support Section

Section Manager: Randy Shuman

Editor: Doug Williams

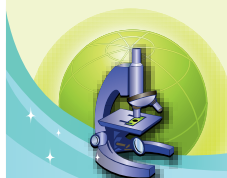
Contributors and Photographers: Larry Jones, Kim Stark, Scott Mickelson, Eric Ferguson, Dan Smith and Angela Grout.


Designer: Laurel Preston

Available on the Web at: <http://www.kingcounty.gov/environment/wlr/science/newsletter.aspx>

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